crown® by HARMAN

ComTech DRIVECORE

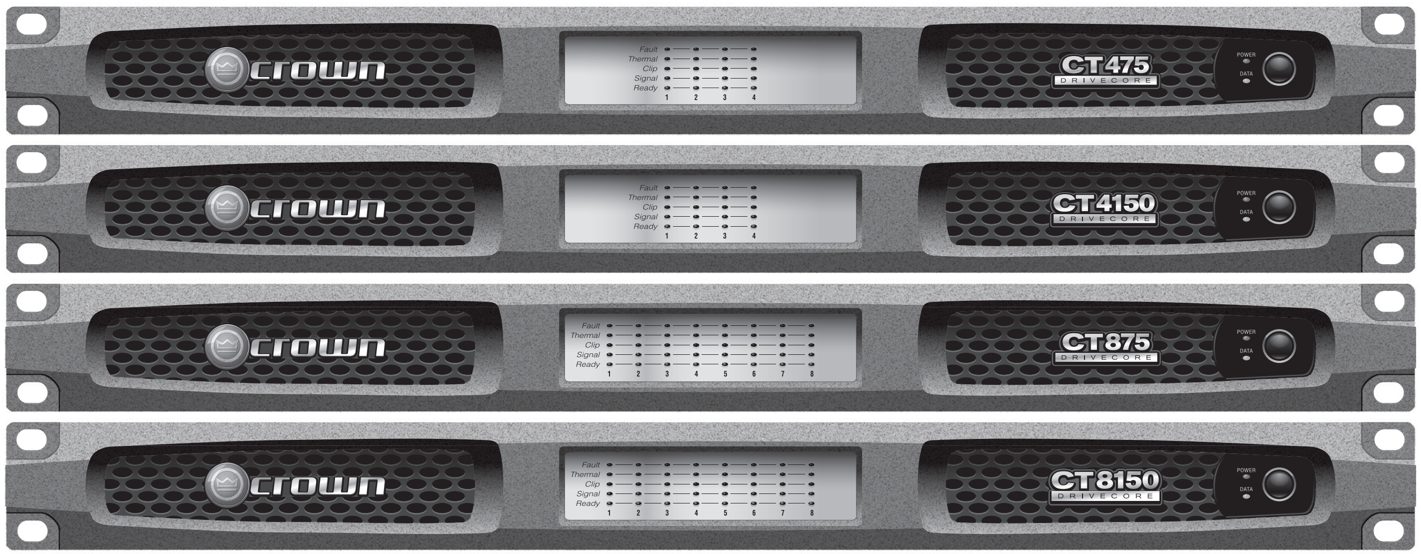
ComTech DriveCore Operation Manual

CT 475

CT 4150

CT 875

CT 8150



Obtaining Other Language Versions: To obtain information in another language about the use of this product, please contact your local Crown Distributor. If you need assistance locating your local distributor, please contact Crown at 574-294-8000.

This manual does not include all of the details of design, production, or variations of the equipment. Nor does it cover every possible situation which may arise during installation, operation or maintenance.

The information provided in this manual was deemed accurate as of the publication date. However, updates to this information may have occurred. To obtain the latest version of this manual, please visit the Crown website at www.crownaudio.com.

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Some models may be exported under the name Amcron.®

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Important Safety Instructions

Wichtige Sicherheitsinstruktionen

Importantes Instructions de Sécurité

Instrucciones de Seguridad Importantes

1. Read these instructions.
2. Keep these instructions.
3. Heed all warnings.
4. Follow all instructions.
5. Do not use this apparatus near water.
6. Clean only with a dry cloth.
7. Do not block any ventilation openings. Install in accordance with the manufacturer's instructions.
8. Do not install near any heat sources such as radiators, heat registers, stoves, or other apparatus (including amplifiers) that produce heat.
9. Do not defeat the safety purpose of the polarized or grounding-type plug. A polarized plug has two blades with one wider than the other. A grounding-type plug has two blades and a third grounding prong. The wide blade or the third prong is provided for your safety. If the provided plug does not fit into your outlet, consult an electrician for replacement of the obsolete outlet.
10. Protect the power cord from being walked on or pinched, particularly at plugs, convenience receptacles, and the point where they exit from the apparatus.
11. Only use attachments/accessories specified by the manufacturer.
12. Use only with a cart, stand, tripod, bracket, or table specified by the manufacturer, or sold with the apparatus. When a cart is used, use caution when moving the cart/apparatus combination to avoid injury from tip-over.



13. Unplug this apparatus during lightning storms or when unused for long periods of time.
14. Refer all servicing to qualified service personnel. Servicing is required when the apparatus has been damaged in any way, such as power-supply cord or plug is damaged, liquid has been spilled or objects have fallen into the apparatus, the apparatus has been exposed to rain or moisture, does not operate normally, or has been dropped.
15. Use the mains plug to disconnect the apparatus from the mains.
16. WARNING: TO REDUCE THE RISK OF FIRE OR ELECTRIC SHOCK, DO NOT EXPOSE THIS APPARATUS TO RAIN OR MOISTURE.
17. DO NOT EXPOSE THIS EQUIPMENT TO DRIPPING OR SPASHING AND ENSURE THAT NO OBJECTS FILLED WITH LIQUIDS, SUCH AS VASES, ARE PLACED ON THE EQUIPMENT.
18. THE MAINS PLUG OF THE POWER SUPPLY CORD SHALL REMAIN READILY OPERABLE.



TO PREVENT ELECTRIC SHOCK DO NOT REMOVE TOP OR BOTTOM COVERS. NO USER SERVICEABLE PARTS INSIDE. REFER SERVICING TO QUALIFIED SERVICE PERSONNEL.

À PRÉVENIR LE CHOC ÉLECTRIQUE N'ENLEVEZ PAS LES COUVERCLES. IL N'Y A PAS DES PARTIES SERVICEABLE À L'INTÉRIEUR. TOUS REPARATIONS DOIT ETRE FAIRE PAR PERSONNEL QUALIFIÉ SEULMENT.

PARA PREVENIR UN CHOQUE ELÉCTRICO, NO RETIRE LAS CUBIERTAS SUPERIOR O INFERIOR. NO EXISTEN PARTES QUE PUEDAN SER REPARADAS POR EL USUARIO AL INTERIOR. REMITA EL SERVICICO AL PERSONAL TÉCHNICAL CALIFICADO.

TO COMPLETELY DISCONNECT THIS EQUIPMENT FROM THE AC MAINS, DISCONNECT THE POWER SUPPLY CORD PLUG FROM THE AC RECEPTACLE. THE MAINS PLUG OF THE POWER SUPPLY CORD SHALL REMAIN READILY OPERABLE.

POUR DÉMONTER COMPLÈTEMENT L'ÉQUIPEMENT DE L'ALIMENTATION GÉNÉRALE, DÉMONTER LE CÂBLE D'ALIMENTATION DE SON RÉCEPTACLE. LA PRISE D'ALIMENTATION RESTERA AISÉMENT FONCTIONNELLE.

PARA DESCONECTAR COMPLETAMENTE EL EQUIPO DEL SUMINSTRO ELECTRICO, DESCONECTE EL CABLE DE ALIMENTACION DE LA TOMA DE CA. LAS PATAS DEL CONECTOR DEL CABLE DE ALIMENTACIÓN DEBERAN MANTENERSE EN BUEN ESTADO.

WATCH FOR THESE SYMBOLS:

The lightning bolt triangle is used to alert the user to the risk of electric shock.

The exclamation point triangle is used to alert the user to important operating or maintenance instructions.

REGARDEZ CES SYMBOLES:

La triangle avec le sigle "foudre" est employée pour alerter l'utilisateur au risque de décharge électrique. Le triangle avec un point d'exclamation est employée pour alerter l'utilisateur d'instruction importantes pour lors opérations de maintenance.

ATENCION CON ESTOS SÍMBOLOS:

El triángulo con el símbolo de rayo eléctrico es usado para alertar al usuario de el riesgo de un choque eléctrico.

El triángulo con el signo de admiración es usado para alertar al usuario de instrucciones importantes de operación o mantenimiento.

CAUTION
RISK OF ELECTRIC SHOCK
DO NOT OPEN

AVIS
RISQUE DE CHOC ÉLECTRIQUE
N'OUVREZ PAS



IMPORTANT

CT Series amplifiers require Class 2 output wiring.
Les amplificateurs de série de CT exigent des câbles de sortie de classe 2.
CT-Reihe-Verstärker verlangen Klasse die 2 Produktionsverdrahtung.
Los amplificadores de la Serie CT requieren de un cableado de salida Clase 2.

MAGNETIC FIELD

CAUTION! Do not locate sensitive high-gain equipment such as preamplifiers directly above or below the unit. Because this amplifier has a high power density, it has a strong magnetic field which can induce hum into unshielded devices that are located nearby. The field is strongest just above and below the unit.

If an equipment rack is used, we recommend locating the amplifier(s) in the bottom of the rack and the preamplifier or other sensitive equipment at the top.

FCC COMPLIANCE NOTICE

This device complies with part 15 of the FCC rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

CAUTION: Changes or modifications not expressly approved by the party responsible for complicance could void the user's authority to operate the euqipment.

NOTE: This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

DECLARATION of CONFORMITY

ISSUED BY: Harman International
1718 W. Mishawaka Road
Elkhart, Indiana 46517 U.S.A.

European Representative's Name and Address:
David Budge
10 Harvest Close
Yateley GU46 6YS
United Kingdom

Equipment Type: Power Amplifiers

Family Name: CT series

Model Names: CT8150, CT875, CT4150, CT475

EMC Standards:

EN 55103-1:1997 Electromagnetic Compatibility – Product Family Standard for Audio, Video, Audio-Visual and Entertainment Lighting Control Apparatus for Professional Use, Part 1: Emissions

EN 55103-1:1997 Magnetic Field Emissions-Annex A @ 10 cm and 1 M

EN 61000-3-2:2006 & Amd 1: 2008 & AMd 2 : 2009 Limits for Harmonic Current Emissions (equipment input current ≤16A per phase)

EN 61000-3-3:1998 Limitation of Voltage Fluctuations and Flicker in Low-Voltage Supply Systems Rated Current ≤16A

EN 55022:2006 Limits and Methods of Measurement of Radio Disturbance Characteristics of ITE: Radiated, Class B Limits; Conducted, Class B

EN 55103-2:1997 Electromagnetic Compatibility – Product Family Standard for Audio, Video, Audio-Visual and Entertainment Lighting Control Apparatus for Professional Use, Part 2: Immunity

EN 61000-4-2:2009 Electrostatic Discharge Immunity (Environment E2-Criteria B, 4k V Contact, 8k V Air Discharge)

EN 61000-4-3:2006 Radiated, Radio-Frequency, Electromagnetic Immunity (Environment E2, Criteria A)

EN 61000-4-4:2007 Electrical Fast Transient/Burst Immunity (Criteria B)

EN 61000-4-5:2006 Surge Immunity (Criteria B)

EN 61000-4-6:2009 Immunity to Conducted Disturbances Induced by Radio-Frequency Fields (Criteria A)

EN 61000-4-11:2001 Voltage Dips, Short Interruptions and Voltage Variation

Safety Standard:

IEC 60065: 2001: 7Ed & Amd 1: 2005 Safety Requirements - Audio Video and Similar Electronic Apparatus

I certify that the product identified above conforms to the requirements of the EMC Council Directive 2004/108/EC and the Low Voltage Directive 2006/95/EC.

Signed

Scott Potosky
Title: Director of Engineering

Date of Issue: March 16, 2011

Due to line current harmonics, we recommend that you contact your supply authority before connection.

Table of Contents



1 Welcome

Crown® ComTech DriveCore™ amplifiers provide state-of-the-art technology for installed sound applications. The ComTech amplifiers provide noiseless operation and small footprint with excellent quality and performance.

ComTech DriveCore amplifiers offer:

1.1 Features

Audiophile Sound

- A signal-to-noise ratio of better than 110dB
- Total harmonic distortion below 0.05% across the full audio bandwidth
- Greater than 70dB crosstalk
- Frequency response of ±0.5dB

Size Advantage

- Up to 8 channels in a single rack-space
- Weight of only 10 pounds (4.54 Kg)

Power Efficiency

- Over 90% efficient in the DriveCore amplifier stage
- Power consumption of less than 1W when not in use (In Deep Sleep)
- Green Mode delivers power when needed. Amplifier efficency increases by up to 10% when compared to typical class D amplifiers

Typical applications for ComTech DriveCore amplifiers include boardrooms, video and teleconferencing, VIP suites in stadiums and arenas, and upscale restaurants and retail outlets.

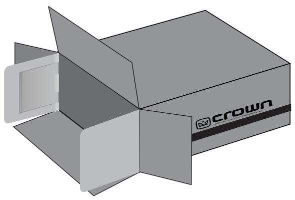
2 How to Use This Manual

This manual provides you with the necessary information to safely and correctly set up and operate your amplifier. It does not cover every aspect of installation, setup, or operation that might occur under every condition. For additional information, please consult Crown's Amplifier Application Guide (available online at www.crownaudio.com), Crown Technical Support, your system installer, or system retailer).

3 Features

- 4 channel or 8 channel (4 inputs with 4 outputs or 8 inputs with 8 outputs)
- Single rack space
- Balanced 3-pin Barrier block-type/line inputs
- 4-pin Phoenix-type speaker outputs
- Flexible input routing
- Multiple Power Configuration (Auto-Standby, Deep Sleep, and Green Mode)
- Auxiliary port for amp status and power saving mode (Deep Sleep)
- Circuit breaker protection with reset switch
- Convection-cooled chassis (no fan)
- Three-year, no-fault, fully transferable warranty that completely protects your investment and guarantees its specifications
- Can be used in mass notification and EN 54 systems
- Patented technology including DriveCore™
- Fault Reporting through Aux Port
- Adaptive Rail Technology for power on demand.
- Complies with Green Edge by Harman

4 Setup



4.1 Unpack Your Amplifier

Please unpack and inspect your amplifier for any damage that may have occurred during transit. If damage is found, notify the transportation company immediately. Only you can initiate a claim for shipping damage. Crown will be happy to help as needed. Save the shipping carton as evidence of damage for the shipper's inspection.

We also recommend that you save all packing materials so you will have them if you ever need to transport the unit. **Never ship the unit without the factory pack.**

YOU WILL NEED (not supplied):

- Input wiring cables
- Output wiring cables
- Flathead screwdriver

Rack for mounting amplifier (or a stable surface for stacking)

WARNING: Before you start to set up your amplifier, make sure you read and observe the Important Safety Instructions found at the beginning of this manual.

4.2 Install Your Amplifier

CAUTION: Before you begin, make sure your amplifier is disconnected from the power source and that all level controls (see section 7.6) are set to 0.

The amplifier is 1.75" tall by 15.19" deep and 19" wide (see figure 4.2.1).

Mount the unit in a standard 19-inch (48.3-cm) equipment rack (EIA RS-310B). You can also place a single amp on a solid, stable surface or stack multiple amps.

NOTE: When transporting, amplifiers should be supported at both front and back.

4.3 Ensure Proper Cooling

When using an equipment rack, mount units directly on top of each other. Close any open spaces in the rack with blank panels. DO NOT block front, top or side air vents.

The side walls of the rack should be a minimum of two inches (5.1 cm) away from the amplifier sides, and the back of the rack should be a minimum of four inches (10.2 cm) from the amplifier back panel. While the amplifier is convection cooled and does not require a fan, it is critical that the air vents are not covered.

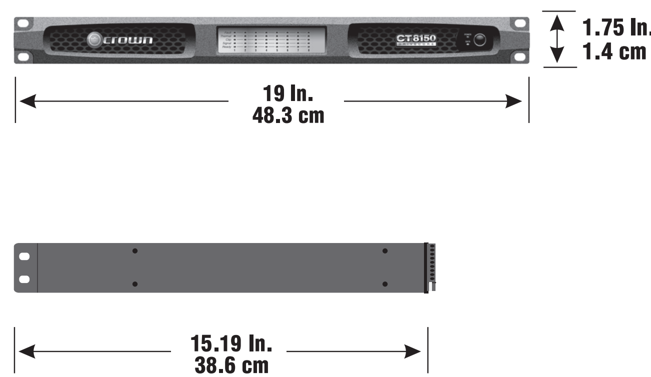


Figure 4.2.1 CT Series Dimensions

4 Setup

4.4 Choose Input Wire and Connectors

Crown recommends using pre-built or professionally wired balanced line (two-conductor plus shield). Balanced wiring provides better rejection of unwanted noise and hum but unbalanced line may also be used. For more information, refer to the Crown Amplifier Application Guide, available online at www.crownaudio.com.

Use 3-pin Phoenix-type cable ends at the amp input connectors.

Figure 4.4.1 shows connector pin assignments for balanced wiring and figure 4.4.2 shows connector pin assignments for unbalanced wiring.

NOTE: Custom wiring should only be performed by qualified personnel. Class 2 wiring is required.

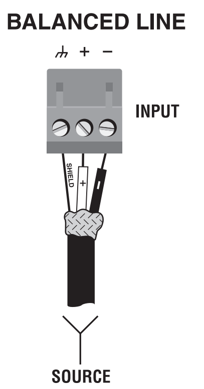


Figure 4.4.1

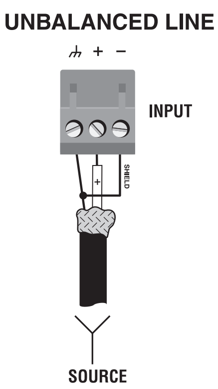


Figure 4.4.2

4.5 Choose Output Wire and Connectors

Crown recommends using professionally constructed, high quality, two-conductor, heavy gauge speaker wire and connectors. Use 2-pin Phoenix-type connectors (Included with the amp).

Suggested below are guidelines to select the appropriate size of wire based on the distance from amplifier to speaker. Check with local code as this may vary.

Distance	Wire Size
up to 25 ft. (7.6m)	16 AWG
26-40 ft. (7.9-12.2m)	14 AWG

CAUTION: Never use shielded cable for output wiring.

CAUTION: Never connect the speaker return to the chassis of the amplifier, or damage to the amplifier may result.

CAUTION: Output of amplifier channels cannot be bridged. This may damage the amplifier.

4 Setup

4.6 Wire Your System

Before you wire your system, you must be familiar with the capabilities of the input routing.

The DriveCore amplifier can be configured in two ways:

1. The input for a channel goes out the same channel. This option is the standard configuration.

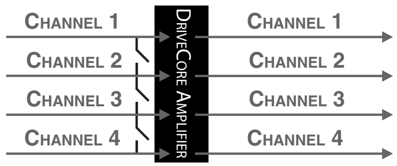


Figure 4.6.1 Four channels with no input routing



Figure 4.6.2 Eight channels with no input routing

2. The input for a channel can be routed to the next channel, overriding the wired input signal for that channel. This method simplifies input wiring and minimizes use of y-cables.

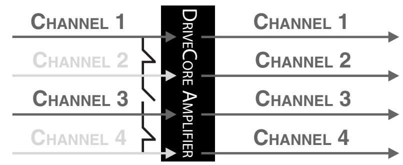


Figure 4.6.3 Two channel to four channel routing

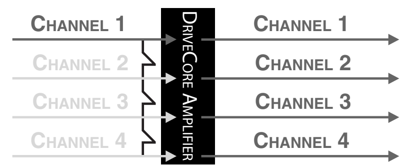


Figure 4.6.4 One channel to four channel routing

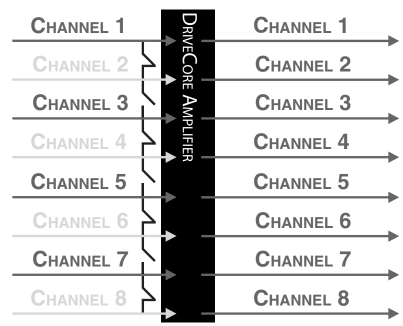


Figure 4.6.5 Four channel to eight channel routing

Input routing is configured using the dip switches on the back of the amplifier. **See Section 11 Input Routing for information on configuring switches.**

Note: ComTech DriveCore amplifiers can NOT be bridged.

4.7 Connect to AC Mains

Connect your amplifier to the AC mains power source (power outlet) with the supplied AC power cordset. First, connect the IEC end of the cordset to the IEC connector on the amplifier; then, plug the other end of the cord set to the AC mains.



WARNING: The third prong of this connector (ground) is an important safety feature. Do not attempt to disable this ground connection by using an adapter or other methods.

Amplifiers don't create energy. The AC mains voltage and current must be sufficient to deliver the power you expect. If the AC line voltage varies out of an acceptable range, the amplifier's power supply turns off and the blue Power LED flashes. The amplifier will turn back on when the AC line voltage returns to safe operating levels.

Figure 4.7.1 provides voltage limits for all amplifier AC voltage configurations. Also, the amplifier must be run within the specified mains frequency requirements (indicated on the amplifier's back panel label). If you are unsure of the output voltage of your AC mains, please consult your electrician.

Model	Under-Voltage Limit	Over-Voltage Limit
All Models	90 VAC	264 VAC

Figure 4.7.1 AC Under-Voltage and Over-Voltage Limits for Various Amplifier Models

4 Setup

4.8 Startup Procedure

Use the following procedure when first turning on your amplifier:

1. Turn down the level of your audio source.
2. Turn down the level controls of the amplifier (see Section 7.6).
3. Turn on the “Power” switch. The Power indicator should glow.
4. Turn up the level of your audio source to an optimum level.
5. Turn up the Level controls on the amplifier until the desired loudness or power level is achieved.

If you ever need to make any wiring or installation changes, don’t forget to turn off the amplifier and disconnect the power cord.

For help with determining your system’s optimum gain structure (signal levels) please refer to the Crown *Amplifier Application Guide*, available online at www.crownaudio.com.

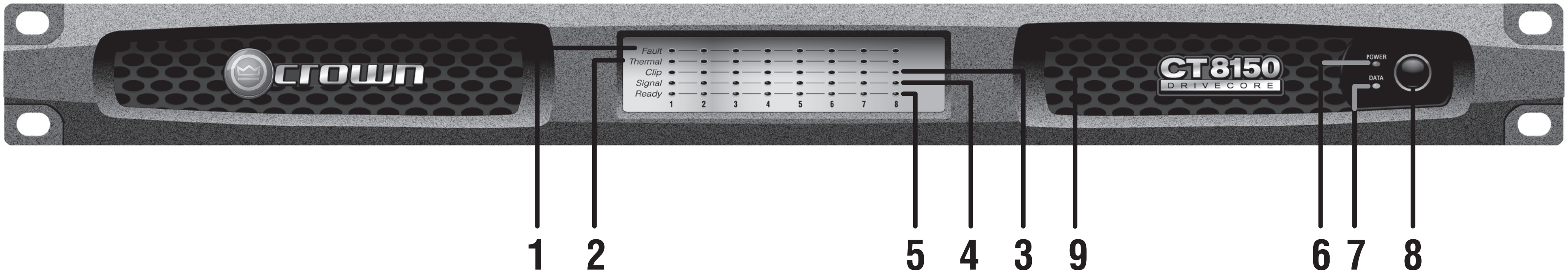
5 Precautions

Your amplifier is protected from internal and external faults, but you should still take the following precautions for optimum performance and safety:

1. Before use, your amplifier first must be configured for proper operation, including input and output wiring hookup. Improper wiring can result in serious operating difficulties. For information on wiring and configuration, please consult the Setup section of this manual or, for advanced setup techniques, consult Crown’s *Amplifier Application Guide* available online at www.crownaudio.com.
2. Use care when making connections, selecting signal sources and controlling the output level. The load you save may be your own!
3. Do not short the ground lead of an output cable to the input signal ground. This may form a ground loop and cause oscillations.
4. **Never connect the output to a power supply, battery or power main. Electrical shock may result.**
5. Tampering with the circuitry, or making unauthorized circuit changes may be hazardous and invalidates all agency listings.
6. Do not operate the amplifier with the red Clip LEDs constantly flashing.
7. Do not overdrive the mixer, which will cause clipped signal to be sent to the amplifier. Such signals will be reproduced with extreme accuracy, and loudspeaker damage may result.
8. Do not operate the amplifier with less than the rated load impedance. Due to the amplifier’s output protection, such a configuration may result in premature clipping and speaker damage.
9. Output of amplifier cannot be bridged or multiple channels cannot be connected together.

Remember: Crown is not liable for damage that results from overdriving other system components.

6 Front Panel



1. Fault Indicator

- Red LED
- One per output channel
- Flashes when the amplifier output channel has stopped operating. Usually this means that the amplifier must be serviced. (See Section 15 Troubleshooting)

2. Thermal Indicator

- Red LED
- One per output channel
- If exceeds Thermal Limits, output channels will shut down in pairs until thermal levels are within tolerant ranges.
- Illuminates when the channel approaches temperature constraints or is about to shut down. Audible distortion may be heard.
- Unit stops amplification for each channel until temperature returns to acceptable level. Once the amp cools off enough, led turns off, audio starts again.

3. Clip Indicator

- Red LED
- One per output channel
- Illuminates when the channel is at the threshold of audible distortion (See Section 15 Troubleshooting – reduce input level)
- When the limiter is turned on the Clip Indicator will illuminate when the limiter is protecting the amplifier from input overload.

4. Signal Indicator

- Green LED
- One per input channel
- Illuminates when the input signal exceeds -24dBu

5. Ready Indicator

- Green LED
- One per input channel
- Illuminates when the channel is ready for signal
- Illuminates when the channel is initialized and ready to produce audio output.
- Ready indicator will flash when the channel is in standby.
- Ready Indictor will not illuminate or flash when the amplifier is in deep sleep.

6. Power Indicator

- Blue LED
- Indicates AC power has been applied and is within the safe operating range of the power supply. The LED will flash when the AC line voltage is above or below the nominal rated value. The LED will also flash when the amplifier is in Deep Sleep mode AND the power button has been pushed.

7. Data Indicator

- Yellow LED (not functional in analog version)
- Indicates network activity
- Reserved for future releases (Lite and DSP)

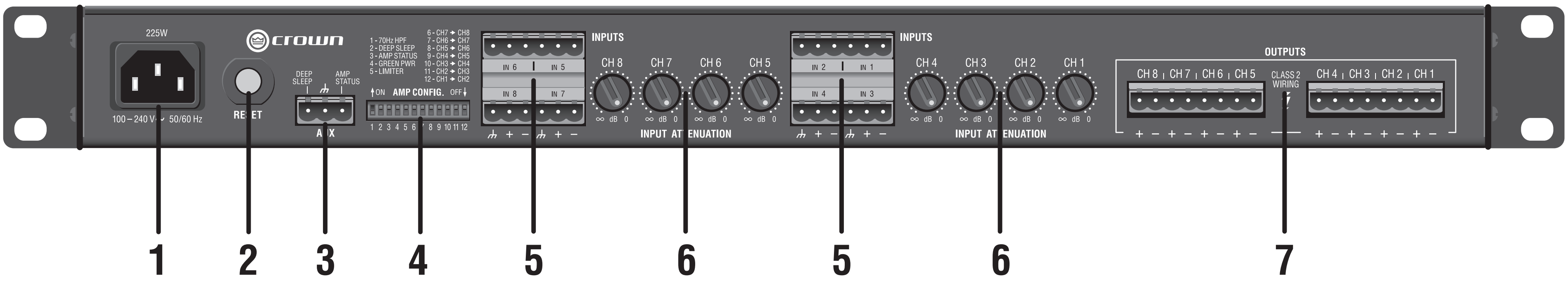
8. Power Button

- On/off push button

9. Cooling Vent

- Allows for air flow and cooling of the amplifier

7 Back Panel



1. AC Power Inlet

- Standard IEC type 320 inlet for detachable connector
- 100-240V

2. Reset Button/Breaker

- Push button switch
- Resets the circuit breaker that protects the power supply
- A circuit breaker located near the IEC power inlet protects the amplifier from excessive AC current draw.

3. Auxiliary Connector

- 3-pin Phoenix type connector
- Allows for amp to be placed in **DEEP SLEEP** mode and monitoring of **AMP STATUS** (see Section 10.2)

4. Amp Configuration DIP Switches (see Amp Status/Configuration in section 10.2)

- Switches 1-5 turn specific settings on and off:
  - -70 Hz HPF (High Pass Filter
  - - see Section 8.1)
  - -Auto-Standby
  - -Amp Status
  - -Green Power (See Section 9.2)
  - -Limiter
- Switches 6-12 sends input channel audio signal to corresponding output channel and adjacent output channel. In four channel model, switch 6-9 are non-functional, (see section 11)

5. Amp Input Connectors

- 3-pin block connector can be used per input
- High impedance balanced

6. Channel Level Controls

- One 21-position detented rotary attenuator per channel
- Attenuation range from -100dB to 0dB

7. Output Speaker Connector

- 4-pin Barrier block type per two channels (2-Pin or 8-Pin Phoenix can be used)

8 Amp Configuration

8.1 70Hz HPF (High Pass Filter)

On the back panel, one 2-position high-pass filter switch will only allow signals above 70Hz to be amplified. This is to prevent transformer saturation. The HPF, when turned on, is activated for all channels. The filter is a 2nd order 12 dB/occ t filter.

8.2 Limiter

The limiter reduces amplifier gain to allow over drive without harsh clipping at output.

When Amp Configuration Switch #5 is set to on (pushed up), the amplifier will utilize the limiter feature.

9 Operating Modes

DriveCore Amplifiers can work in a variety of power modes.

9.1 Normal

The amplifier automaticaly operates full output power.

9.2 Green Power

Green mode utilizes Crown's adaptive rail technology for higher efficiency or power on demand. When Amp Configuration DIP switch #4 is set to on, the amplifier will operate in green mode.

For low input signal levels (less than –40dBu) the amplifier will operate with minimum power.

The amplifier will increase to full power if either of the following occurs:

1 - The input signal goes above -40dBu

2 - There is a single clip event from any of the channels

Likewise, if the amplifier is operating with full power, the amplifier will decrease the operating rails to minimum power if the input signal drops below -40dBu.

Through the use of Green Power, the efficiency of the amplifier dramatically increases for lower audio signal reproduction. The adaptive rail technology used in the CT amplifiers can increase the efficiency of the amplifier by up to 10% with low signal levels.

9.3 Deep Sleep

See Section 10.1

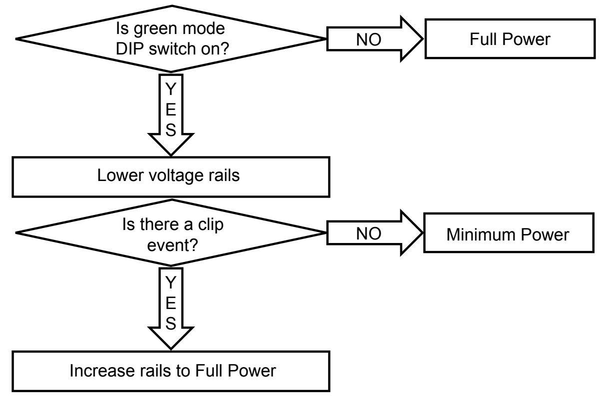


Figure 9.2.1 How Green Power DIP switches work

10 Auxiliary Port

10.1 Deep Sleep

In deep sleep mode, the amp consumes less than 1 watt of power. It is activated via the AUX port with a ground closure.

To bring the amplifier out of deep sleep, remove the ground closure via the AUX port.

10.2 Amp Status

The **Amplifier Status** is designed to work with life safety or supervisory monitoring and control systems, where notification of an amplifier fault is necessary. The **Amplifier Status** is producing a signal (Heartbeat or tone) when the amplifier is operating within standard working parameters. If the amplifier enters a fault or thermal condition, the **Amplifier Status** signal will terminate. This feature in the ComTech amplifier is always on. The **Amplifier Status** is located on the Auxiliary Port, opposite the **DEEP SLEEP** function. The configuration of the Amp Status signal is possible through DIP Switch #3:

- **ON** – the microcontroller will send a 1 Hz pulse to the **"AMP STATUS"** AUX port line
- **OFF** – the microcontroller will send a logic high level to the **"AMP STATUS"** AUX port line

The voltage output of the AuxPort is 5VDC at 50 milliamps. This TTL or similar signal can then be connected to an interface to indicate the status to a supervisory control system.

Amp status can be used in a variety of life safety applications, such as EN54, IEC60849 among others.

11 Input Routing

This amplifier can route a single channel to the next numbered channel.

In CT 475 and CT 4150, DIP switches 6-9 are non-functional.

When a DIP switch is set to "on" for a specific channel, it sends the signal to its own output AND becomes the input for the next numbered channel, overriding the wired input for that channel.

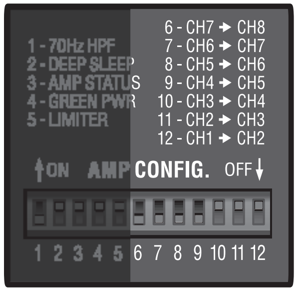


Figure 11.1

Channel 1 intput sent to all channel outputs, overriding channel inputs for channels 2,3, and 4

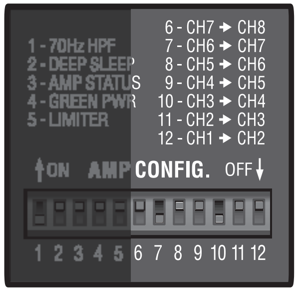


Figure 11.3

Channel 1 input sent to channels 1, 2, and 3
Channel 4 input sent to channels 4, 5, and 6
Channel 7 input sent to channels 7 and 8

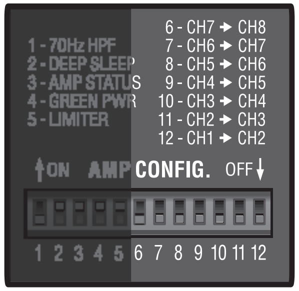


Figure 11.2

Four input signals sent to four outputs

13 Advanced Features

13.1 Protection Systems

Your Crown amplifier provides extensive protection and diagnostic capabilities, including thermal level control, fault indicators, high-pass filtering, DC protect, AC under/over voltage protection, inrush limiting, and a convection-cooled chassis.

13.1.1 Thermal Indicator

If the amplifier becomes too hot for safe operation, the channel that is generating too much heat will be shut down until the temperature is reduced.

13.1.2 Fault

The amplifier will enter a Fault state if the amplifier senses an unsafe condition. This protection is for both internal and external faults. It is critical to check all wiring to and from the amplifier to ensure the fault is not caused by external conditions. Once wiring has been verified to be correct, and the fault condition persists, see Section 17 Service for Servicing information.

13.1.3 High-Pass Filters

HPF's are traditionally used in Hi-Z applications. The Com-Tech DriveCore is a low Z amplifier but can be used in conjunction with the XFMR 4/8 transformer box for Hi-Z applications. If the amplifier is to be used in a Hi-Z application, then it is very important to use the HPF to prevent transformer saturation.

13.1.4 AC Under/Over Voltage Protection

If the AC line voltage drops below 25% or rises above 15% of the nominal operating voltage of the amplifier, the amplifier's power supply turns off and the blue Power LED flashes. The amplifier will turn back on when the AC line voltage returns to safe operating levels (within ±10%).

13.1.5 Circuit Breaker

A circuit breaker located near the IEC power inlet protects the amplifier from excessive AC current draw.

13.1.6 Convection-cooled Chassis

The DriveCore amplifiers require no fans for cooling, providing quiet operation and optimum efficiency.

13.1.7 Auto-Standby

If amplifier does not see input signals for a period of 30 minutes, the amplifier will go into standby mode. The amplifier will come out of standby mode once an input signal is present. This feature is activated via DIP switch #2 on the back of the amplifier. The amplifier will be configured with Auto-Standby turn-on from the factory. When the amplifier is in Standby, the Ready Indicator on the front panel Display will flash.

13.2 Features

13.2.1 Switching Power Supply

Crown's Switching Power Supply minimizes the amplifier's weight. Typical non-switching power supplies require large, heavy transformers in order to produce the required power at the output stage. These transformers must be large to operate at 50 to 60 Hz (standard AC supplied by the power company).

By contrast, switching power supplies can operate with a much smaller (and lighter) transformer because they first convert the AC up to a much higher frequency, thereby reducing waste. The power supply is voltage-specific, allowing use in regions using 100V or 240V.

13.2.2 Power Mode

Deep sleep and green mode allow the amplifier to operate at all times with the lowest possible power level.

13.2.3 Adaptive Rail Technology (ART)

Crown has developed a voltage rail technology that delivers power on demand. ART is at the center of CT DriveCore's Green mode that provides up to an additional 10% of efficiency. Through ART, the CT DriveCore is always operating at maximum efficiency.

13.2.4 DriveCore Power Stage

Crown has worked with Texas Instruments to develop an audio amplifier on a micro-chip. The result is DriveCore chipset that introduces audiophile quality for an installation amp:

-Greater than 90% Efficiency
-118dB Signal to Noise
-THD less than .05% in midband frequencies

14 Accessories

14.1 XFMR 4/8

The ComTech DriveCore amplifier is only capable of low Z applications. It is necessary to use an outboard transformer for Hi-Z applications. Crown highly recommends the use of the XFMR 4/8 transformer box. This transformer box is designed to mate with the top of the ComTech DriveCore Amplifiers. See XFMR data sheet for wiring diagram.

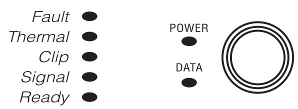
14.2 Rack Support Ears

The ComTech DriveCore amplifier requires front and back rack support for proper mounting. These have been provided with the amplifier.

15 Troubleshooting

15.1 Power Indicator

OFF

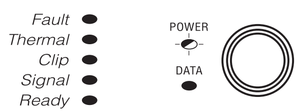


CONDITION: Power indicator is OFF.

POSSIBLE REASON

- The amplifier has lost AC power.
- The amplifier's Power switch is off.
- The amplifier is not plugged into the power receptacle.
- The amplifier output level is so high that the power supply circuit breaker has tripped. Allow the unit to cool. Turn down the Level controls. Press the Reset Switch on the back panel.

FLASHING



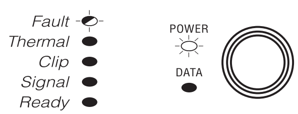
CONDITION: Power indicator is FLASHING.

POSSIBLE REASON

- The AC line voltage has dropped below +15/-25 or has risen above +15/-25% of the nominal line voltage of the power supply.
- Amp is in Deep Sleep Mode.

15.2 Fault Indicator

FLASHING



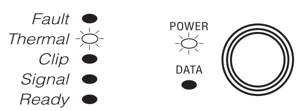
CONDITION: Fault indicator is FLASHING.

POSSIBLE REASON

- The amplifier channel has stopped operating. Refer the unit to an authorized Crown Service Center.
- Check for shorted outputs

15.3 Thermal Indicator

ON

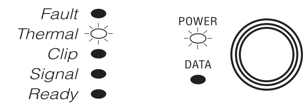


CONDITION: Thermal indicator is ON.

POSSIBLE REASON

- The amplifier is becoming too hot for safe operation. Allow amplifier to cool. Check for loads less than 4 ohms, and for excessive input levels. Check for proper ventilation and proper mode-switch setting.

FLASHING



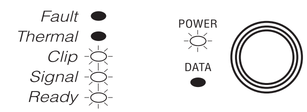
CONDITION: Thermal indicator is flashing

POSSIBLE REASON

- Amplifier has become too hot to operate. Allow amplifier to cool. Amplifier will not pass audio if amplifier has become too hot

15.4 Clip Indicator

ON or FLASHING



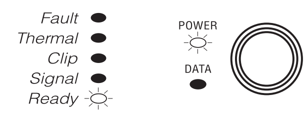
CONDITION: Clip indicator is ON or FLASHING.

POSSIBLE REASON

- input level or output level is distorting

15.5 Signal Indicator

OFF



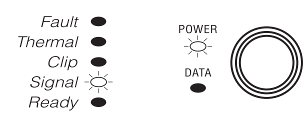
CONDITION: Signal indicator is flashing even though audio is applied, and the channel is ready.

POSSIBLE REASON

- Input signal level is very low
- Level controls are turned down

15.6 Ready Indicator

OFF

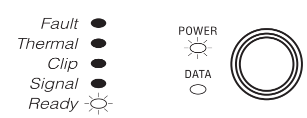


CONDITION: Ready indicator is OFF.

POSSIBLE REASON

- Amplifier may be in deep sleep

FLASHING



CONDITION: Ready Indicator flashing

POSSIBLE REASON

- Amplifier is in Standby mode. Flashing will stop once there is an input signal.

16 Specifications

Performance	CT475	CT4150	CT875	CT8150
Channels	4	4	8	8
Sensitivity	1.4V*	1.4V*	1.4V*	1.4V*
Rated Power Output	75W per channel into 8/4 ohms	125W per channel into 8/4 ohms	75W per channel into 8/4 ohms	125W per channel into 8/4 ohms
Signal to Noise Ratio (below rated power 20Hz to 20kHz, A-Weighted)	110 dB	110 dB	110 dB	110 dB
Total Harmonic Distortion (THD) (full rated power, 1kHz)	< 0.05%	< 0.05%	< 0.05%	< 0.05%
Intermodulation Distortion (from 0dB down to -30dB)	< 0.05%	< 0.05%	< 0.05%	< 0.05%
Frequency Response (at 1W into 4/8 ohms)	± 0.5 dB	± 0.5 dB	± 0.5 dB	± 0.5 dB
Common Mode Rejection (20Hz to 1kHz)	> 70 dB	> 70 dB	> 70 dB	> 70 dB
Load Ranges	4-160 Ohms	4-160 Ohms	4-160 Ohms	4-160 Ohms

General	CT475	CT4150	CT875	CT8150
Dimension (H x W x D)	1.75" x 19" x 15.19"	1.75" x 19" x 15.19"	1.75" x 19" x 15.19"	1.75" x 19" x 15.19"
Net Weight	10 lbs	10 lbs	10 lbs	10 lbs
Net Shipping Weight	15 lbs	15 lbs	15 lbs	15 lbs

***26dBgain**
****Amplifier is stable for 20hm loads**

17 AC Power Draw and Thermal Dissipation

AC Power Draw and Thermal Disspation:
Pink noise 12dB crest factor, bandwidth limited 22Hz to 22kHz.
Typical line impedance used.
Measurements made with 120/240 VAC mains.
Data based on all channels driven at 8 Ohms.

ComTech DriveCore 475													
	Load	Watts in	Watts out	120VAC		Watts Dissipated	Watts in	Watts out	240VAC		Watts Dissipated	Thermal Dispation	
				Line Current	Watts Out Per 1A Line Current				Line Current	Watts Out Per 1A Line Current		btu/hr	kcal/hr
Idle (Deep Sleep)	-	0.9		<0.1		1.00	0.90				1	3.41	0.86
Idle (Auto Standby)	-	11		0.30		11.00	10.00		0.22		15.8	53.88	13.57
Idle (Awake)	-	15		0.40		15.00	13.20		0.25		25	85.25	21.48
Idle (Green Power)	-	9.7		0.25		-	9		0.20		-	-	-
1/8th Power Pink Noise	8	64	38	1.25	30	27	62	38	0.80	47	25	90.37	22.76
	6	65	38	1.33	28	27	64	38	0.84	45	27	92.07	23.19
	4	70	38	1.35	28	33	66	38	0.90	42	29	110.83	27.92
1/3rd Power Pink Noise	8	142	100	2.65	38	42	140	100	1.60	63	40	143.22	36.08
	6	147	100	2.70	37	47	145	100	1.70	59	45	160.27	40.37
	4	150	100	2.75	36	50	149	100	1.80	56	49	170.50	42.95
1/8th Power Sine	8	62	38	1.22	31	24	60	38	0.73	51	23	83.27	20.98
	6	63	38	1.23	30	25	61	38	0.74	51	24	85.59	21.56
	4	65	38	1.27	30	27	63	38	0.76	49	26	92.41	23.28
1/3rd Power Sine	8	138	100	2.52	40	38	136	100	1.50	67	36	130.26	32.81
	6	141	100	2.56	39	41	138	100	1.52	66	38	138.62	34.92
	4	146	100	2.64	38	46	144	100	1.58	63	44	155.84	39.26

17 AC Power Draw and Thermal Dissipation

AC Power Draw and Thermal Disspation:

Pink noise 12dB crest factor, bandwidth limited 22Hz to 22kHz.
Typical line impedance used.
Measurements made with 120/240 VAC mains.
Data based on all channels driven at 8 Ohms.

ComTech DriveCore 4150													
	Load	Watts in	Watts out	120VAC		Watts Dissipated	Watts in	Watts out	240VAC		Watts Dissipated	Thermal Dispation	
				Line Current	Watts Out Per 1A Line Current				Line Current	Watts Out Per 1A Line Current		btu/hr	kcal/hr
Idle (Deep Sleep)	-	0.9		<0.1		1.00	0.90		<0.1		1	3.41	0.86
Idle (Auto Standby)	-	11.9		0.35		11.90	10.90		0.28		15.8	53.88	13.57
Idle (Awake)	-	17.5		0.60		17.50	16.50		0.37		25	85.25	21.48
Idle (Green Power	-	9.7		0.25		-	9		0.20		-	-	-
1/8th Power Pink Noise	8	98	63	1.90	33	36	96	63	1.20	53	33	121.06	30.49
	6	102	63	2.10	30	40	120	63	1.25	50	39	134.70	33.93
	4	115	63	2.20	28	53	105	63	1.32	48	42	179.03	45.10
1/3rd Power Pink Noise	8	225	167	3.95	42	58	230	167	2.45	68	63	214.83	54.12
	6	230	167	4.00	42	63	244	167	2.55	65	77	262.57	66.14
	4	240	167	4.15	40	73	248	167	2.60	64	81	276.21	69.58
1/8th Power Sine	8	95	63	1.80	35	32	94	63	1.08	58	31	109.12	27.49
	6	96	63	1.82	34	34	95	63	1.09	57	33	114.24	28.78
	4	100	63	1.89	33	38	99	63	1.13	55	37	127.88	32.21
1/3rd Power Sine	8	222	167	3.89	43	55	221	167	2.34	71	54	188.23	47.42
	6	227	167	3.98	42	60	225	167	2.37	70	58	205.96	51.88
	4	237	167	4.12	40	70	235	167	2.48	67	68	238.02	59.96

17 AC Power Draw and Thermal Dissipation

AC Power Draw and Thermal Disspation:

Pink noise 12dB crest factor, bandwidth limited 22Hz to 22kHz.
Typical line impedance used.
Measurements made with 120/240 VAC mains.
Data based on all channels driven at 8 Ohms.

ComTech DriveCore 875													
				120VAC					240VAC			Thermal Dispation	
	Load	Watts in	Watts out	Line Current	Watts Out Per 1A Line Current	Watts Dissipated	Watts in	Watts out	Line Current	Watts Out Per 1A Line Current	Watts Dissipated	btu/hr	kcal/hr
Idle (Deep Sleep)	-	0.9		<0.1		1.00	0.90		<0.1		1	3.41	0.86
Idle (Auto Standby)	-	17		0.40		17.00	15.50		0.25		15.8	57.97	14.60
Idle (Awake)	-	23		0.50		23.00	21.00		0.32		25	85.25	21.48
Idle (Green Power)	-	14.5		0.40		-	14		0.30		-	-	-
1/8th Power Pink Noise	8	117	75	2.40	31	42	114	75	1.32	57	39	143.22	36.08
	6	121	75	2.50	30	46	117	75	1.40	54	42	156.86	39.51
	4	126	75	2.60	29	51	122	75	1.60	47	47	173.91	43.81
1/3rd Power Pink Noise	8	277	200	4.66	43	77	270	200	2.85	70	70	262.57	66.14
	6	284	200	4.90	41	84	275	200	2.90	69	75	286.44	72.16
	4	292	200	5.30	38	92	283	200	3.00	67	83	313.72	79.03
1/8th Power Sine	8	115	75	2.11	35	40	113	75	1.27	59	38	136.40	34.36
	6	116	75	2.14	35	41	114	75	1.28	58	39	139.81	35.22
	4	119	75	2.20	34	44	118	75	1.32	57	43	150.04	37.80
1/3rd Power Sine	8	269	200	4.60	43	69	266	200	2.77	72	66	236.31	59.53
	6	273	200	4.66	43	73	269	200	2.80	71	69	248.93	62.71
	4	283	200	4.82	42	84	279	200	2.90	69	79	285.08	71.81

17 AC Power Draw and Thermal Dissipation

AC Power Draw and Thermal Disspation:

Pink noise 12dB crest factor, bandwidth limited 22Hz to 22kHz.
Typical line impedance used.
Measurements made with 120/240 VAC mains.
Data based on all channels driven at 8 Ohms.

ComTech DriveCore 8150

	Load	Watts in	Watts out	120VAC		Watts Dissipated	Watts in	Watts out	240VAC		Watts Dissipated	Thermal Dispation	
				Line Current	Watts Out Per 1A Line Current				Line Current	Watts Out Per 1A Line Current		btu/hr	kcal/hr
Idle (Deep Sleep)	-	0.9		<0.1		1.00	1.00		<0.1		1	3.41	0.86
Idle (Auto Standby)	-	17		0.35		17.00	15.80		0.28		15.8	57.97	14.60
Idle (Awake)	-	26.5		0.60		26.50	25.00		0.37		25	90.37	22.76
Idle (Green Power)	-	14.5		0.40		-	14		0.30		-	-	-
1/8th Power Pink Noise	8	179	122	3.40	36	57	185	125	2.10	60	60	204.60	51.54
	6	221	155	4.00	39	66	210	150	2.10	71	60	225.06	56.69
	4	207	131	3.50	37	76	201	125	2.10	60	76	259.16	65.28
1/3rd Power Pink Noise	8	438	325	7.60	43	113	445	330	4.30	77	115	392.15	98.79
	6	550	400	6.50	62	150	525	321	4.50	71	204	695.64	175.24
	4	525	349	5.70	61	176	510	309	4.40	70	201	685.41	172.66
1/8th Power Sine	8	183	125	3.37	37	58	180	125	1.93	65	55	197.78	49.82
	6	221	152	4.00	38	68	221	155	2.33	67	66	232.90	58.67
	4	205	133	3.74	36	72	198	131	2.12	62	67	245.52	61.85
1/3rd Power Sine	8	452	334	7.85	43	118	436	329	4.36	75	107	402.38	101.36
	6	570	413	9.93	42	157	558	413	5.56	74	145	535.37	134.86
	4	507	349	8.79	40	158	495	350	4.93	71	145	538.78	135.72

18 Service

Crown amplifiers are quality units that rarely require servicing. Before returning your unit for service, please contact Crown Technical Support to verify the need for servicing.

This unit has very sophisticated circuitry which should only be serviced by a fully trained technician. This is one reason why each unit bears the following label:

CAUTION: To prevent electric shock, do not remove covers. No user serviceable parts inside. Refer servicing to a qualified technician.

Complete the Crown Audio Factory Service Information form, in the back of this manual, when returning a Crown product to the factory or authorized service center. The form must be included with your product inside the box or in a packing slip envelope securely attached to the outside of the shipping carton. Do not send this form separately.

Warranty is only valid within the country in which the product is purchased.

17.1 International and Canada Service

Service may be obtained from an authorized service center. (Contact your local Crown/Amcron representative or our office for a list of authorized service centers.) To obtain service, simply present the bill of sale as proof of purchase along with the defective unit to an authorized service center. They will handle the necessary paperwork and repair. Remember to transport your unit in the original factory pack.

17.2 US Service

Service may be obtained in one of two ways: from an authorized service center or from the factory. You may choose either. It is important that you have your copy of the bill of sale as your proof of purchase.

17.2.1 Service at a US Service Center

This method usually saves the most time and effort. Simply present your bill of sale along with the defective unit to an authorized service center to obtain service. They will handle the necessary paperwork and repair. Remember to transport the unit in the original factory pack. A list of authorized service centers in your area can be obtained from Crown Factory Service, or online from http://www.crownaudio.com/support/servcent.htm.

17.2.2 Factory Service

Crown accepts no responsibility for non-serviceable product that is sent to us for factory repair. It is the owner's responsibility to ensure that their product is serviceable prior to sending it to the factory. Serviceable product list is available at
http://crownweb.crownintl.com/crownrma/.
For more information, please contact us direct.

A Service Return Authorization (SRA) is required for product being sent to the factory for repair. An SRA can be completed online at www.crownaudio.com/support/factserv.htm. If you do not have access to the web, please call Crown's Customer Service at 574.294.8200 or 800.342.6939 extension 8205.

For warranty service, we will pay for ground shipping both ways in the United States. Contact Crown Customer Service to obtain prepaid shipping labels prior to sending the unit. Or, if you prefer, you may prepay the cost of shipping, and Crown will reimburse you. Send copies of the shipping receipts to Crown to receive reimbursement. Your repaired unit will be returned via UPS ground. Please contact us if other arrangements are required.

17.2.3 Factory Service Shipping Instructions:

1. Service Return Authorization (SRA) is required for product being sent to the factory for service. Please complete the SRA by going to www.crownaudio.com/support/factserv.htm. If you do not have access to our website, call 1.800.342.6939, extension 8205 and we'll create the SRA for you.
2. See packing instructions that follow.
3. Ship product to:
   CROWN AUDIO FACTORY SERVICE
   1718 W MISHAWKA RD.
   ELKHART, IN 46517
4. Use a bold black marker and write the SRA number on three sides of the box.
5. Record the SRA number for future reference. The SRA number can be used to check the repair status.

17.2.4 Packing Instructions

Important: These instructions must be followed. If they are not followed, Crown Audio, Inc. assumes no responsibility for damaged goods and/or accessories that are sent with your unit.

1. Fill out and include the Crown Audio Factory Service Information sheet in the back of this manual.
2. Do not ship any accessories (manuals, cords, hardware, etc.) with your unit. These items are not needed to service your product. We will not be responsibility for these items.
3. When shipping your Crown product, it is important that it has adequate protection. We recommend you use the original pack material when returning the product for repair. If you do not have the original box, please call Crown at 800.342.6939 or 574.294.8210 and order new pack material. See instructions for "foam-in-place" shipping pack. (Do not ship your unit in a wood or metal cabinet.)
4. If you provide your own shipping pack, the minimum recommended requirements for materials are as follows:

a. 275 P.S.I. burst test, Double-Wall carton that allows for 2-inch solid Styrofoam on all six sides of unit or 3 inches of plastic bubble wrap on all six sides of unit.

b. Securely seal the package with an adequate carton sealing tape.

c. Do not use light boxes or "peanuts". Damage caused by poor packaging will not be covered under warranty.

Using your 'foam-in-place' shipping pack

Note: The foam-in-place packing is molded so that there is only one correct position for your product.

1. Open carton and lift center cushion leaving both end-cushions in place.
2. Carefully place your product with the product's front panel facing the same direction as arrows indicate.
3. Reset center cushion down over top of product's chassis. The foam-in-place packing was molded to accommodate different chassis depth sizes. If your product's chassis does not completely fill the foam-in-place cavity, you may use a soft but solid packing material (such as paper or bubble wrap) behind the chassis.
4. Enclose the completed Crown Audio Factory Service Information form (or securely attach it to the outside of carton) and re-seal the shipping pack with a sturdy carton sealing tape.

17.2.5 Estimate Approval

Approval of estimate must be given within 30 days after being notified by Crown Audio Inc. Units still in the possession of Crown after 30 days of the estimate will become the property of Crown Audio Inc.

17.2.6 Payment of Non-Warranty Repairs

Payment on out-of-waranty repairs must be received within 30 days of the repair date. Units unclaimed after 30 days become the property of Crown Audio Inc.

If you have any questions, please contact Crown Factory Service.

Crown Factory Service
1718 W. Mishawaka Rd.,
Elkhart, Indiana 46517 U.S.A.

Telephone:
574.294.8200
800.342.6939 (North America,
Puerto Rico, and Virgin Islands only)

Facsimile:
574.294.8301 (Technical Support)
574.294.8124 (Factory Service)

Internet:
http://www.crownaudio.com

19 Warranty

18.1 UNITED STATES & CANADA

SUMMARY OF WARRANTY

Crown International, 1718 West Mishawaka Road, Elkhart, Indiana 46517-4095 U.S.A. warrants to you, the ORIGINAL PURCHASER and ANY SUBSEQUENT OWNER of each NEW Crown product, for a period of three (3) years from the date of purchase by the original purchaser (the "warranty period") that the new Crown product is free of defects in materials and workmanship. We further warrant the new Crown product regardless of the reason for failure, except as excluded in this Warranty.

Warranty is only valid within the country in which the product was purchased.

ITEMS EXCLUDED FROM THIS CROWN WARRANTY

This Crown Warranty is in effect only for failure of a new Crown product which occurred within the Warranty Period. It does not cover any product which has been damaged because of any intentional misuse, accident, negligence, or loss which is covered under any of your insurance contracts. This Crown Warranty also does not extend to the new Crown product if the serial number has been defaced, altered, or removed.

WHAT THE WARRANTOR WILL DO

We will remedy any defect, regardless of the reason for failure (except as excluded), by repair, replacement, or refund. We may not elect refund unless you agree, or unless we are unable to provide replacement, and repair is not practical or cannot be timely made. If a refund is elected, then you must make the defective or malfunctioning product available to us free and clear of all liens or other encumbrances. The refund will be equal to the actual purchase price, not including interest, insurance, closing costs, and other finance charges less a reasonable depreciation on the product from the date of original purchase. Warranty work can only be performed at our authorized service centers or at the factory. Warranty work for some products can only be performed at our factory. We will remedy the defect and ship the product from the service center or our factory within a reasonable time after receipt of the defective product at our authorized service center or our factory. All expenses in remedying the defect, including surface shipping costs in the United States, will be borne by us. (You must bear the expense of shipping the product between any foreign country and the port of entry in the United States including the return shipment, and all taxes, duties, and other customs fees for such foreign shipments.)

HOW TO OBTAIN WARRANTY SERVICE

You must notify us of your need for warranty service within the warranty period. All components must be shipped in a factory pack, which, if needed, may be obtained from us free of charge. Corrective action will be taken within a reasonable time of the date of receipt of the defective product by us or our authorized service center. If the repairs made by us or our authorized service center are not satisfactory, notify us or our authorized service center immediately.

DISCLAIMER OF CONSEQUENTIAL AND INCIDENTAL DAMAGES

YOU ARE NOT ENTITLED TO RECOVER FROM US ANY INCIDENTAL DAMAGES RESULTING FROM ANY DEFECT IN THE NEW CROWN PRODUCT. THIS INCLUDES ANY DAMAGE TO ANOTHER PRODUCT OR PRODUCTS RESULTING FROM SUCH A DEFECT. SOME STATES DO NOT ALLOW THE EXCLUSION OR LIMITATIONS OF INCIDENTAL OR CONSEQUENTIAL DAMAGES, SO THE ABOVE LIMITATION OR EXCLUSION MAY NOT APPLY TO YOU.

WARRANTY ALTERATIONS

No person has the authority to enlarge, amend, or modify this Crown Warranty. This Crown Warranty is not extended by the length of time which you are deprived of the use of the new Crown product. Repairs and replacement parts provided under the terms of this Crown Warranty shall carry only the unexpired portion of this Crown Warranty.

DESIGN CHANGES

We reserve the right to change the design of any product from time to time without notice and with no obligation to make corresponding changes in products previously manufactured.

LEGAL REMEDIES OF PURCHASER

THIS CROWN WARRANTY GIVES YOU SPECIFIC LEGAL RIGHTS, YOU MAY ALSO HAVE OTHER RIGHTS WHICH VARY FROM STATE TO STATE. No action to enforce this Crown Warranty shall be commenced after expiration of the warranty period.

THIS STATEMENT OF WARRANTY SUPERSEDES ANY OTHERS CONTAINED IN THIS MANUAL FOR CROWN PRODUCTS. 10/10

19 Warranty

18.2 WORLDWIDE EXCEPT USA & CANADA

SUMMARY OF WARRANTY

Crown International, 1718 West Mishawaka Road, Elkhart, Indiana 46517-4095 U.S.A. warrants to you, the ORIGINAL PURCHASER and ANY SUBSEQUENT OWNER of each NEW Crown[1] product, for a period of three (3) years from the date of purchase by the original purchaser (the "warranty period") that the new Crown product is free of defects in materials and workmanship, and we further warrant the new Crown product regardless of the reason for failure, except as excluded in this Warranty.

Warranty is only valid within the country in which the product is purchased.

1 Note: If your unit bears the name "Amcron," please substitute it for the name "Crown" in this warranty.

ITEMS EXCLUDED FROM THIS CROWN-WARRANTY

This Crown Warranty is in effect only for failure of a new Crown product which occurred within the Warranty Period. It does not cover any product which has been damaged because of any intentional misuse, accident, negligence, or loss which is covered under any of your insurance contracts. This Crown Warranty also does not extend to the new Crown product if the serial number has been defaced, altered, or removed.

WHAT THE WARRANTOR WILL DO

We will remedy any defect, regardless of the reason for failure (except as excluded), by repair, replacement, or refund. We may not elect refund unless you agree, or unless we are unable to provide replacement, and repair is not practical or cannot be timely made. If a refund is elected, then you must make the defective or malfunctioning product available to us free and clear of all liens or other encumbrances. The refund will be equal to the actual purchase price, not including interest, insurance, closing costs, and other finance charges less a reasonable depreciation on the product from the date of original purchase. Warranty work can only be performed at our authorized service centers. We will remedy the defect and ship the product from the service center within a reasonable time after receipt of the defective product at our authorized service center.

HOW TO OBTAIN WARRANTY SERVICE

You must notify your local Crown importer of your need for warranty service within the warranty period. All components must be shipped in the original box. Corrective action will be taken within a reasonable time of the date of receipt of the defective product by our authorized service center. If the repairs made by our authorized service center are not satisfactory, notify our authorized service center immediately.

DISCLAIMER OF CONSEQUENTIAL AND INCIDENTAL DAMAGES

YOU ARE NOT ENTITLED TO RECOVER FROM US ANY INCIDENTAL DAMAGES RESULTING FROM ANY DEFECT IN THE NEW CROWN PRODUCT. THIS INCLUDES ANY DAMAGE TO ANOTHER PRODUCT OR PRODUCTS RESULTING FROM SUCH A DEFECT.

WARRANTY ALTERATIONS

No person has the authority to enlarge, amend, or modify this Crown Warranty. This Crown Warranty is not extended by the length of time which you are deprived of the use of the new Crown product. Repairs and replacement parts provided under the terms of this Crown Warranty shall carry only the unexpired portion of this Crown Warranty.

DESIGN CHANGES

We reserve the right to change the design of any product from time to time without notice and with no obligation to make corresponding changes in products previously manufactured.

LEGAL REMEDIES OF PURCHASER

No action to enforce this Crown Warranty shall be commenced after expiration of the warranty period.

THIS STATEMENT OF WARRANTY SUPERSEDES ANY OTHERS CONTAINED IN THIS MANUAL FOR CROWN PRODUCTS. 10/10

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PRODUCT REGISTRATION

Crown Audio, Inc.
1718 W. Mishawaka Rd.
Elkhart, IN 46517-9439
Phone: 574-294-8000
Fax: 574-294-8329
www.crownaudio.com

Online registration is also available at http://crownweb.crownintl.com/webregistration.

Warranty is only valid within the country in which the product is purchased.

When this form is used to register your product, it may be mailed or faxed.

Crown Audio, Inc.
1718 W Mishawaka Rd
Elkhart IN 46517

Fax: 574-294-8329

Please note that some information is required. Incomplete registrations will not be processed. * Indicates required information.

CUT ON THIS LINE

OWNER'S INFORMATION - PLEASE PRINT

* First name: ______________________ Middle initial: _____ * Last name: ________________________________
Company: ____
* Mailing address: ____
* City: ____________________________ * State: ____________________________ * Zip Code: ________________
* Country: ____________________________ E-mail address: ____
* Phone # (include area code): ____________________________ Fax #: __________________________________

PRODUCT INFORMATION

* MODEL e.g. IT8000, CDi1000, PCC160	* SERIAL # e.g. 8000000000	* PURCHASE DATE mo/day/yr
________________________________	____________________	______/_____/_____
________________________________	____________________	______/_____/_____
________________________________	____________________	______/_____/_____
________________________________	____________________	______/_____/_____

Product purchased from: *(Business/Individual) ____________________________ Country: _________________________
Comments: ____
____
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Crown Audio Factory Service Information

Shipping Address: Crown Audio Factory Service, 1718 W. Mishawaka Rd., Elkhart, IN 46517

PLEASE PRINT CLEARLY

SRA #: __________________(If sending product to Crown factory service.) Model: ____ Serial Number: _____________________ Purchase Date: _____________

PRODUCT RETURN INFORMATION

Individual or Business Name: ____

Phone #: ____ Fax #: ____ E-Mail: ____

Street Address (please, no P.O. Boxes): ____

City: ____ State/Prov: ________________________________ Postal Code: _________________ Country: _________________________

Nature of problem: ____

____

____

Other equipment in your system: ____

If warranty is expired, please provide method of payment. Proof of purchase may be required to validate warranty.

PAYMENT OPTIONS

☐ I have open account payment terms. Purchase order required. PO#: __________________________________ ☐ COD

☐ Credit Card (Information below is required; however if you do not want to provide this information at this time, we will contact you when your unit is repaired for the information.)

Credit card information:

Type of credit card: ☐ MasterCard ☐ Visa ☐ American Express ☐ Discover

Type of credit card account: ☐ Personal/Consumer ☐ Business/Corporate

Card # ____ Exp. date: _____________ * Card ID #: __________________________

* Card ID # is located on the back of the card following the credit card #, in the signature area. On American Express, it may be located on the front of the card. This number is required to process the charge to your account. If you do not want to provide it at this time, we will call you to obtain this number when the repair of your unit is complete.

Name on credit card: ____

Billing address of credit card: ____

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crown®

by HARMAN